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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/460,630 12/14/99 DIERICKX

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EXAMINER

LEE, E

ART UNIT	PAPER NUMBER
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2815

DATE MAILED:

05/23/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/460,630

Applicant(s)

DIERICKX, BART

Examiner

Eugene Lee

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 1999.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I (claims 1-11) in Paper No. 7 is acknowledged.
2. Claim 12 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7.

Specification

3. The disclosure is objected to because of the following informalities: on page 5, line 11, there is no space between word "electronics" and the word "are"; on page 5, line 15, the word "the" should be removed; on page 7, line 22, the word "shielding" is spelled incorrectly; on page 8, line 28, the word "counteracted" is spelled incorrectly.

Appropriate corrections are required.

Claim Objections

4. Claim 7 is objected to because of the following informalities: on line 4, there is no space between word "electronics" and the word "are." Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the limitation "the shielding regions" and "the readout electronics" in lines 4 and 5 of said claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 5, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamamura '044. Yamamura discloses (see, for example, FIG. 5F) a solid state imager (detector of electromagnetic radiation) comprising a substrate region 22, dielectric layer (insulating layer) 31, charge transfer region (collection region) 30, and forward electrode (dual purpose electrode) 34. When a voltage is applied to the forward electrode, a charge storage layer for positive charges in the light receiving area is formed along with a depletion layer that provides a channel for charge transfer.

9. Claims 1, and 4 thru 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Takemoto et al. '048. See, for example, FIG. 2 where Takemoto discloses a solid state imaging device (detector of electromagnetic radiation) comprising a silicon body (substrate) 11, n-type diffused layer (collection region) 12, n-type diffused layer (detection region) 14, pn junction-

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capacitance 18, silicon dioxide film (insulating layer) 16, output terminal (read-out electronics) 8 and gate electrode (dual-purpose electrode) 13. A voltage is applied to the gate electrode in order to bias the n-type diffused layer for charge storage and transfer. Also see column 1, lines 35-*

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2, 3, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto et al. '048 as applied to claims 1 and 4 thru 6 above, and further in view of Kuroda et al. '013. Takemoto does not disclose a barrier region of the first conductivity type with a concentration density of dopants being higher than the concentration density of dopants in the substrate. However, Kuroda discloses (see, for example, FIG. 5) a solid state image pickup element comprising a p⁺-type layer (barrier region) 13 surrounding an n-type region 5, 11. Kuroda teaches that providing such a layer will redirect a charge 14 to the photodiode 1. See, for example, column 2, lines 56-*. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the p⁺-type layer underneath the n-type diffused layer of Takemoto in order to direct charges to the pn junction and, consequently, reduce smearing, as taught by Kuroda.

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12. Claims 9 thru 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto et al. '048 as applied to claims 1 and 4 thru 6 above, and further in view of Hook et al. '702 B1. Takemoto does not disclose a pinning region. However, Hook discloses (see, for example FIG. 3l) an active pixel sensor cell comprising a pinning region 70 partially covered and self-aligned with gates 68, 68'. See, for example, column 5, lines 3-18. It was well known in the art at the time of invention that pinning regions were used to improve the gathering of electrons within a semiconductor layer. See, for example, column 1, lines 15-23. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the pinning region of Hook in Takemoto's invention in order to improve the collection and retention of electrons within the n-type diffused layer (collection region).

INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 703-305-5695. The examiner can normally be reached on M-F 8-5.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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Eugene Lee
May 17, 2001



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